PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

A Reconnaissance Survey Of Dina Lake (#6)

A. R. Langston
1993

PWFWCP Report No. 113

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

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105-02833/

A RECONNAISSANCE SURVEY OF

DINA LAKE (#6)

WATERSHED: Parsnip River

DATE OF SURVEY: June 10, 11, 1993

FIELD CREW LEADER: A.R. McLean

FIELD ASSISTANT: B.M. Sterling

PEACE/WILLISTON COMPENSATION PROGRAM

B. C. HYDRO

ENVIRONMENTAL AFFAIRS

and

B.C. ENVIRONMENT

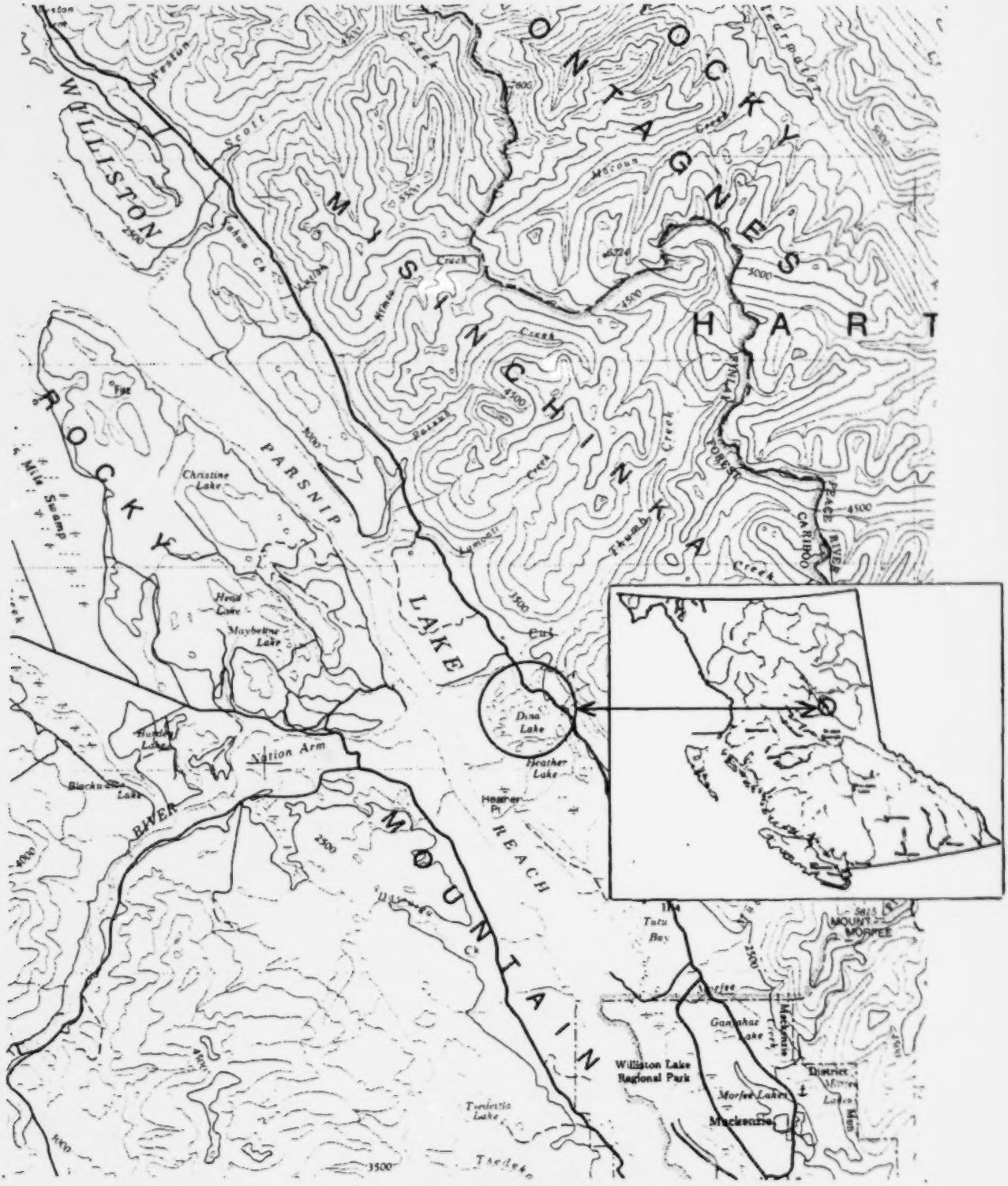
FISH AND WILDLIFE BRANCH

REPORT PREPARED BY: A.R. Langston

RELEASED BY: _____

Don Cadden, (Acting) Regional Fisheries Biologist

Figure 1. Location of Dina Lakes Scale 1:250 000



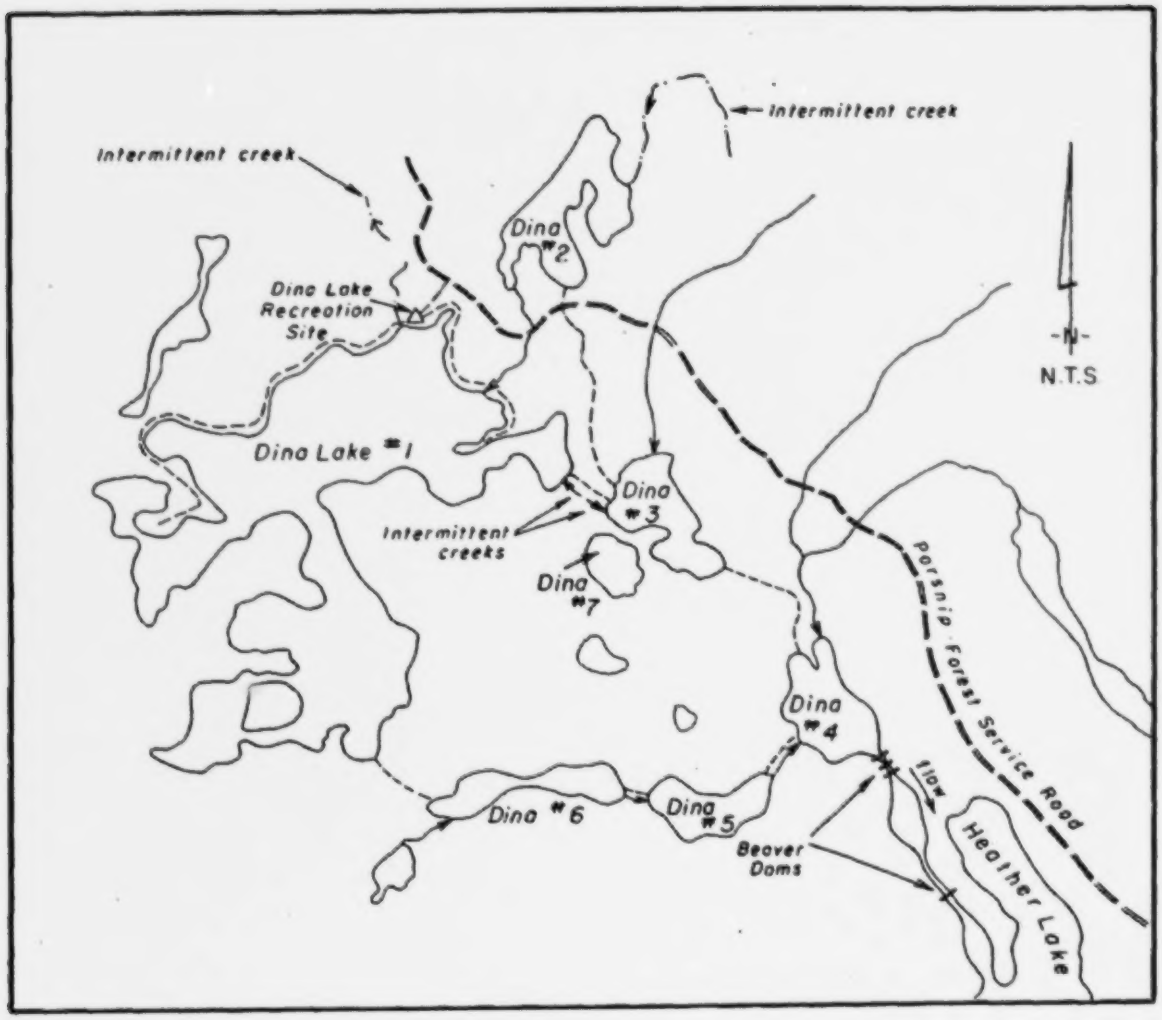
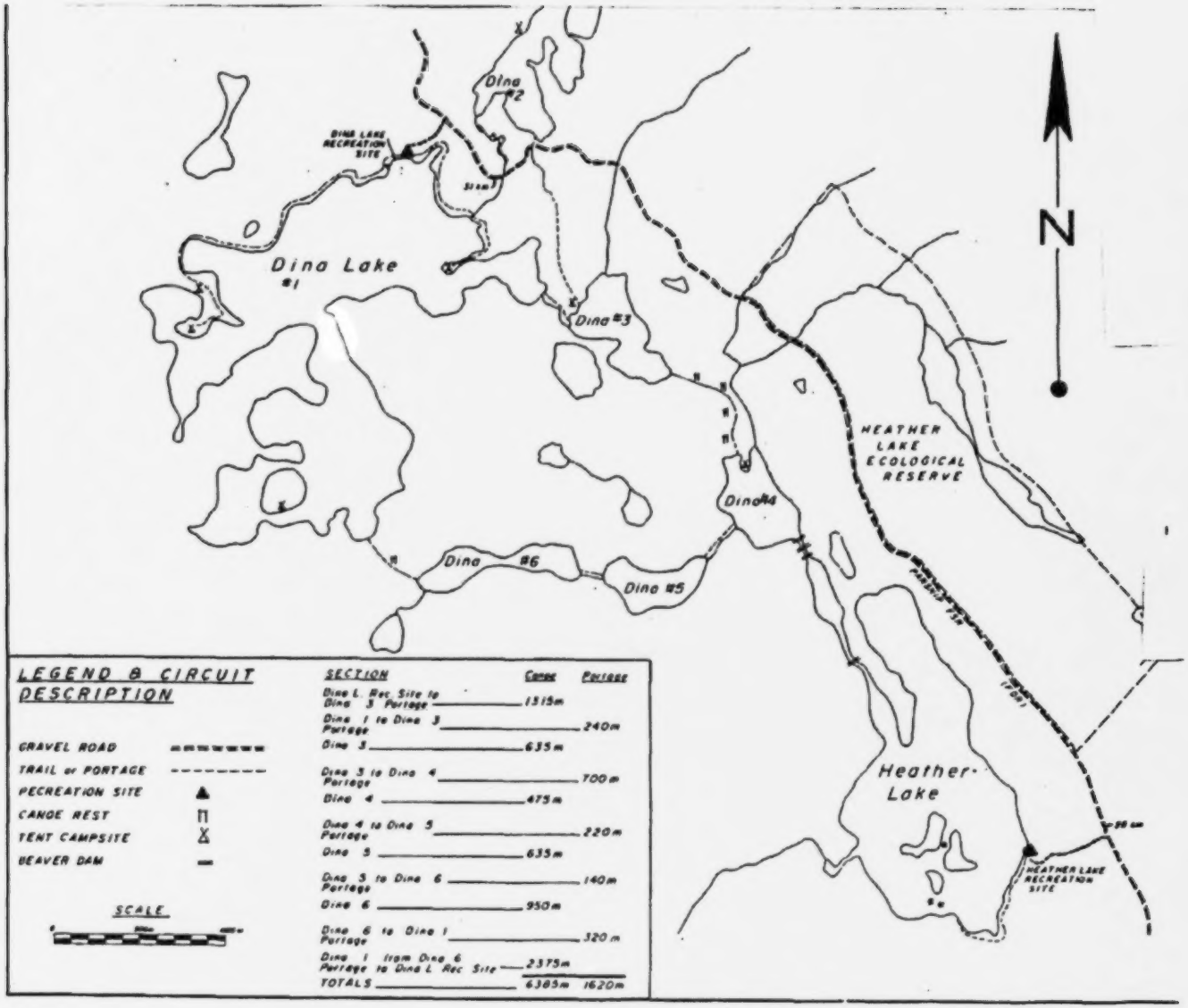


Figure 2 The Dina Lakes.

Forest Service

Recreation Sites

Heather - Dina Lakes Canoe Circuit



LEGEND & CIRCUIT DESCRIPTION

GRAVEL ROAD	▬▬▬▬
TRAIL or PORTAGE	- - - - -
RECREATION SITE	▲
CANOE REST	⊓
TENT CAMPSITE	⛺
BEAVER DAM	▬

SCALE

SECTION	Canoe	Portage
Dina L. Rec. Site to Dina 3 Portage	1315m	
Dina 1 to Dina 3 Portage		240m
Dina 3	635m	
Dina 3 to Dina 4 Portage		700m
Dina 4	475m	
Dina 4 to Dina 5 Portage		220m
Dina 5	635m	
Dina 5 to Dina 6 Portage		140m
Dina 6	950m	
Dina 6 to Dina 1 Portage		320m
Dina 1 from Dina 6 Portage to Dina L. Rec. Site	2375m	
TOTALS	6385m	1620m

LAKE: **Dina #6**

SYSTEM NAME: Unnamed C.

A.S.A.P. REFERENCE NO.:

SYSTEM NO: 230-9039-000 [5]

DATA ON FILE FOR THIS SURVEY

Location	x	Dissolved O2/Temp. Profiles	x
Physical Data	x	Winter Dissolved 02/Temp. Profiles	x
Bench Mark	x	Netting Record	x
Terrain Features	x	Lake Catch Summary	x
Access	x	Individual Fish Data	--
Resorts and Campsites	x	Fish Preserved	--
Other Developments	x	Stomach Analysis	--
Obstructions and Pollutions	x	Scale Reading	--
Special Restrictions	x	Location of Inventory Sites	x
Aquatic Plants	x	Photograph Directory	x
Wildlife Observations	x	Appendices:	
Miscellaneous Comments	x	A: Water Chemistry Analysis	x
Lake Drainage	x	B: Tributary Stream Data	x
Fisheries Management Comments	x	Bathymetric Map Reduction	x
History of Previous Surveys	x	Bathymetric Map	x
Water Chemistry Summary	x		

LOCATION

Location: 25 km. north, north west of Mackenzie
Elevation: 686 m +/-
Latitude/Longitude: 55°30'36":123°17'14" U.T.M.: 10.4819.61513
Management Unit: 7-30 N.T.S. Map No.: 93-0/11 edition 2

Drainage: Outlet C.-->Dina Lake (#5)-->Unnamed C.-->Dina Lake (#4)--> Unnamed C.-->Heather Lake-->Unnamed C.-->Williston Reservoir (Parsnip Reach)-->Peace River

PHYSICAL DATA

Lake Drainage Area:	-- km^2	Volume:	707,000 m^3
Water Surface Area:	152,000 m^2	Flushing Rate:	
Area above 6 m contour:	106,000 m^2	Perimeter of Islands:	--m
Shoreline Perimeter:	2,700 m	Number of Islands:	0
Maximum Depth:	18.1 m	Mean Depth:	4.7 m
Filterable Residue (TDS):	23 mg/l	Secchi Reading:	1.7m

Sounding Device: Lowrance X-15

Elevation Source: Contour interpolation

BENCH MARK

(Iron spike, centre of red circle) located at east end of lake, near Forest Service portage trail access point. Bench mark is set 2.0 m above current lake level in a 17 cm diameter spruce tree located 2.0 m from waters edge.

High water mark: Lake appears to be at maximum pondage.

TERRAIN FEATURES

Immediate Shoreline:

The terrain immediately surrounding the lake is moderate to steep. Dina Lake #6 is treed to shoreline. Small sporadic clearings occur vegetated with various species of shrubs and sedgegrass. Forest cover is predominately coniferous (spruce, pine, and hemlock) with sparsely intermixed birch. Shoreline substrate is organic in nature. The lake bottom drops off moderate to steeply along the entire lake shore. Forest Service canoe portage trail access points are located at the east and west ends of the lake.

Surrounding Country:

The forest cover is continuous, consisting predominantly of conifers (spruce, pine, hemlock), with birch sparsely intermixed. Dina Lake #6 is surrounded by gently sloping terrain, with a view of moderate-steeply sloped mountain peaks to the east.

Dina Lake #6 is situated within the sub-boreal spruce biogeoclimatic zone.

ACCESS

Directions:

Dina Lake #6 is approximately a (7) seven minute helicopter flight from a cutblock located 31.6 km north of Mackenzie on the Parsnip Forest Service Road.

Alternately access can be achieved by driving north 28.6 km on the Parsnip Forest Service Road from Mackenzie to the Dina Lake Recreation Site (B.C. Forest Service) and gain access into Dina Lake #6 via the "Dina Lakes Canoe Circuit" (canoe required).

Note- The Parsnip Forest Service Road is a gravel "main haul" logging road. This road is not cleared of snow in some winters.

Road Type and Conditions:

None.

Restrictions:

None noted.

RESORTS AND CAMPSITES

None

A canoe portage trail (for the Dina Lakes Canoe Circuit) exists at east and west ends of the lake, the access points are marked with easily identifiable, highly visible red triangular signs.

SPECIAL RESTRICTIONS

None noted.

AQUATIC PLANTS

The aquatic plant Potamogeton sp. was moderately abundant, located mainly near the lake shore. Sedgegrass was sporadically present along the lake shore. Nuphar sp. was observed, but sparsely distributed. All species were identified in the field, none were collected.

WILDLIFE OBSERVATIONS

1 robin

1 hawk

MISCELLANEOUS COMMENTS

A management plan encompassing all the Dina Lakes has been produced by D.A. Jesson, Fisheries Branch, Prince George.

Bathymetric map: The lake outline is from an enlargement of aerial photograph B.C. 7366 No. 210, flown July 1971.

LAKE DRAINAGE

General:

Dina Lake #6 has two inlets and one outlet. The outlet flows approximately 140 m to its confluence with Dina Lake #5. Dina Lake #5's outlet flows 250 m to it's confluence with Dina Lake #4. Dina Lake #4's outlet flows southeast 780 m to Heather Lake. Heather Lake's outlet drains southwest approximately 2.5 km to its confluence with Williston Reservoir (Parsnip Reach).

Major Systems:

There are no major systems.

Minor Systems:

Unnamed C. - inlet #1

This inlet flows approximately 200 m from a small pond and enters at the west end of Dina Lake #6. At the time of survey no noticeable flow was detected, and no useable fish habitat was noted. The wetted width of this inlet was an average of 0.4 meters.

Unnamed C. - inlet #2

This intermittent inlet is likely activated by snow melt or high rainfall. The channel was dry at the time of survey and offers no potential for fish use.

Minor Systems (continued):

Unnamed C. - outlet

This creek is approximately 140 m in length and drains from the east end of Dina Lake #6 into the northwest end of Dina Lake #5. An active beaver dam is located at the mouth of the inlet and controls the lake level of Dina Lake #6. This beaver dam is 9.5 m in length and 1.2 m in height and is a barrier to upstream fish migration into Dina Lake #6. Approximately 25 m downstream of the dam the inlet had an average wetted width of 0.25 m, average depth of 2 cm and no noticeable flow. This meandering outlet offers no salmonid spawning or rearing habitat.

See point card for additional information. (Appendix B)

FISHERIES MANAGEMENT COMMENTS

Dina Lake #6 supports a population of coarse fish. Two overnight net sets yielded northern squawfish and one sucker. No salmonids were captured. No salmonid spawning habitat was observed, and creation of such would be expensive due to the present lack of access and further complicated by beaver activity. Low winter oxygen levels indicate the potential for a winter kill occurrence. Due to the presence of northern squawfish, and lack of spawning habitat, a stocking program appears questionable at this time.

The fish resources in the Dina Lakes system are not presently over exploited by angler demand/use. Heather Lake and Dina Lakes #1, #2, #3, and #7 all contain sport fish species. If future angler demand/use becomes a burden to the fish populations in these lakes the potential exists to create a fishery in Dina Lake #6. The possibility of frequent winterkill occurrences must be addressed first.

No stocking or enhancement projects are recommended or viable at this time.

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

An oxygen/temperature series was collected on Dina Lake #6 on March 19, 1991 by A.R. McLean, Peace/Williston Compensation Program, Prince George.

Other Related Surveys:

None known.

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	June 11, 1993		
Time:	1415 hrs	Air Temperature:	12.5 °C
Wind Velocity:	0	Wind Direction:	
Cloud Cover:	9/10 o.c.	Surface Condition:	calm
Secchi Disc:	1.7 m	Water Colour:	tannic

Method(s) Used:

Dissolved Oxygen:	YSI model 58 oxygen/temperature meter
Water Temperature:	YSI model 58 oxygen/temperature meter
Air Temperature:	Hand-held alcohol thermometer
Ph (field):	Digital pH pocket tester
H2S (field):	Hach H2S field test kit
Laboratory Used:	Zenon Environmental Inc. B.C. Laboratory Services
Water Sampler:	Vertical Alpha Water Bottle (Vandorn)
Substrate Sampler:	Substrate sample not taken

Water Sample Chemistry: SEAM Site No.: Not determined.

	Sampling Depths	
	Surface (0 m)	Lower (9.0 m)
pH (field)	8.2	7.4
pH (lab)	6.5	6.3
Specific Conductance (lab)	12 umhos	44 umhos
Filterable Residue 105°C (lab)	23 mg/l	30 mg/l
H2S (field)	-- mg/l	0.2 mg/l

Bottom Depth:	17.2 m
Substrate Sample Depth:	-- m

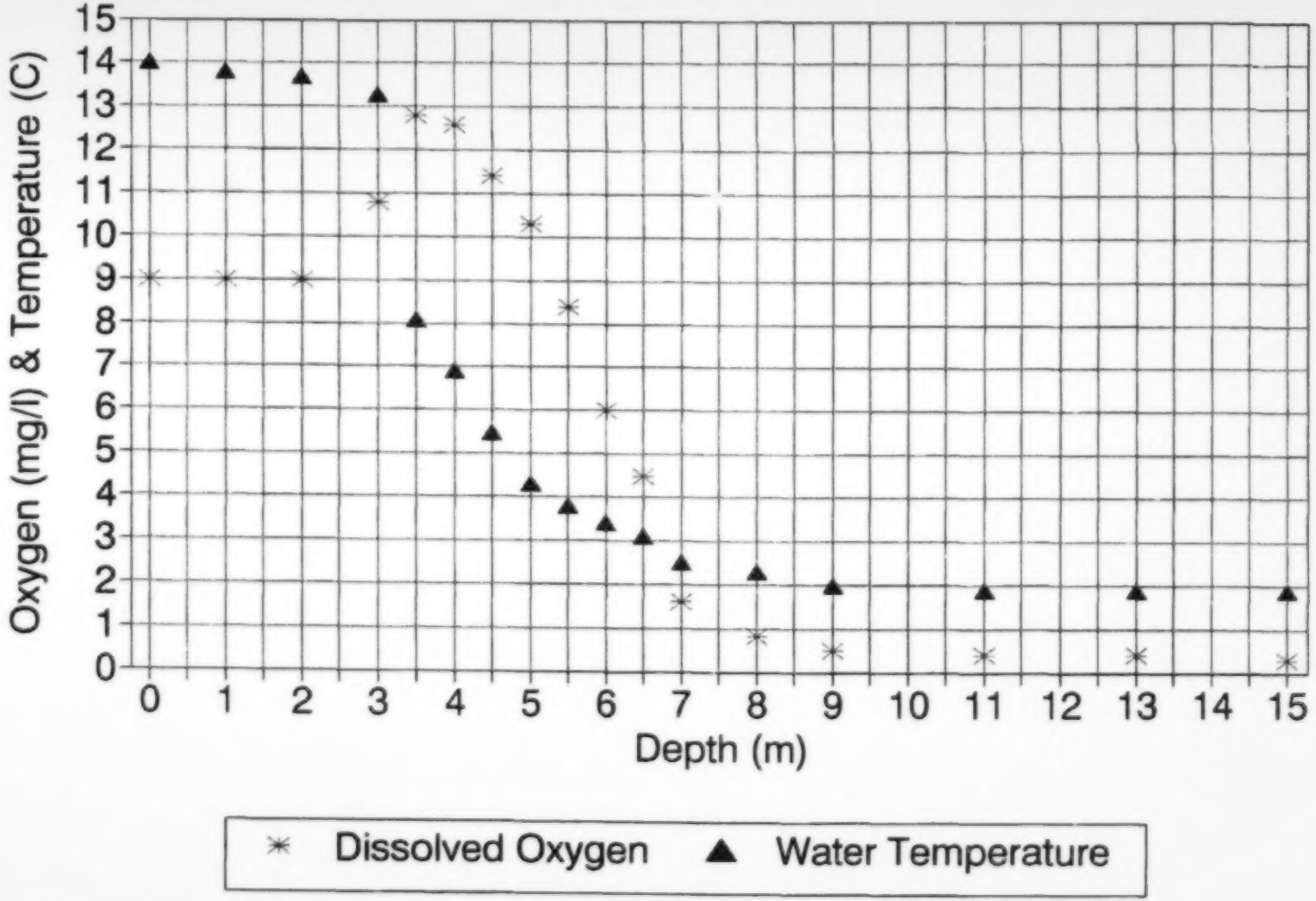
DATE: June 11, 1993

SUMMER OXYGEN/TEMPERATURE DATA

DEPTH (m)	02 (mg/l)	TEMP (°C)
Surface	9.0	14.0
1.0	9.0	13.8
2.0	9.0	13.7
3.0	10.8	13.3
3.5	12.8	8.1
4.0	12.6	6.9
4.5	11.4	5.5
5.0	10.3	4.3
5.5	8.4	3.8
6.0	6.0	3.4
6.5	4.5	3.1
7.0	1.6	2.5
8.0	0.8	2.3
9.0	0.5	2.0
11.0	0.4	1.9
13.0	0.4	1.9
15.0	0.3	1.9
17.0	Bottom	

SUMMER

DISSOLVED OXYGEN AND TEMPERATURE SERIES



Date:	March 19, 1991	Crew:	A.R. McLean
Time:	1000 hrs	Snow depth:	4 cm
Air temp.:	6 °C	Ice depth:	61 cm
Wind:	nil	Weather:	overcast

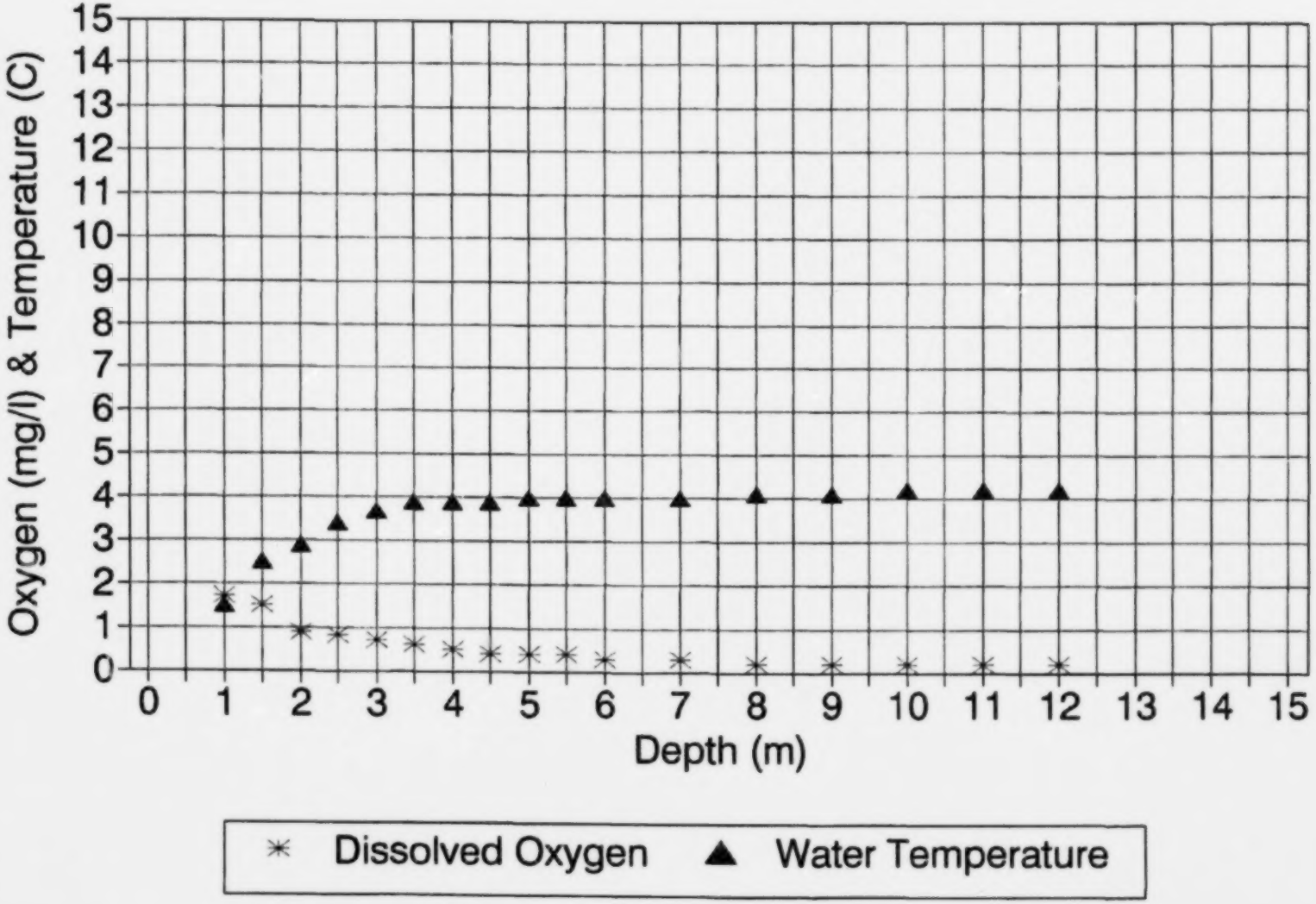
WINTER OXYGEN/TEMPERATURE DATA

DEPTH (m)	02 (mg/l)	TEMP (°C)
Surface *	-	-
0.5	-	-
1.0	1.7	1.5
1.5	1.5	2.5
2.0	0.9	2.9
2.5	0.8	3.4
3.0	0.7	3.7
3.5	0.6	3.9
4.0	0.5	3.9
4.5	0.4	3.9
5.0	0.4	4.0
5.5	0.4	4.0
6.0	0.3	4.0
7.0	0.3	4.0
8.0	0.2	4.1
9.0	0.2	4.1
10.0	0.2	4.2
11.0	0.2	4.2
12.0	0.2	4.2
13.0	Bottom	

* Surface if referenced from top of ice, ie. surface = top of ice.

WINTER

DISSOLVED OXYGEN AND TEMPERATURE SERIES



NETTING RECORD

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	June 10, 1993	Time:	1800 hrs
Date Lifted:	June 11, 1993	Time:	1000 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	1.0 m
		Substrate:	organics
Deep End Mesh Size:	64 mm	Depth:	9.5 m
		Substrate:	organics

NETTING SITE #2

Type:	Sinking monofilament		
Date Set:	June 10, 1993	Time:	1020 hrs
Date Lifted:	June 10, 1993	Time:	1250 hrs
Net Dimensions:	Length: 91.4 m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	1.0 m
		Substrate:	organics
Deep End Mesh Size:	64 mm	Depth:	9.0 m
		Substrate:	organics

LAKE CATCH SUMMARY

SPECIES	NET SITE NO.				ANGLED	OTHER	TOTAL	NUMBER SAMPLED	NUMBER PRESERVED	SIZE RANGE (cm)
	1	2	3	4						
longnose sucker		1					1			24
northern squawfish	4	1					5			8 - 11

Comments:

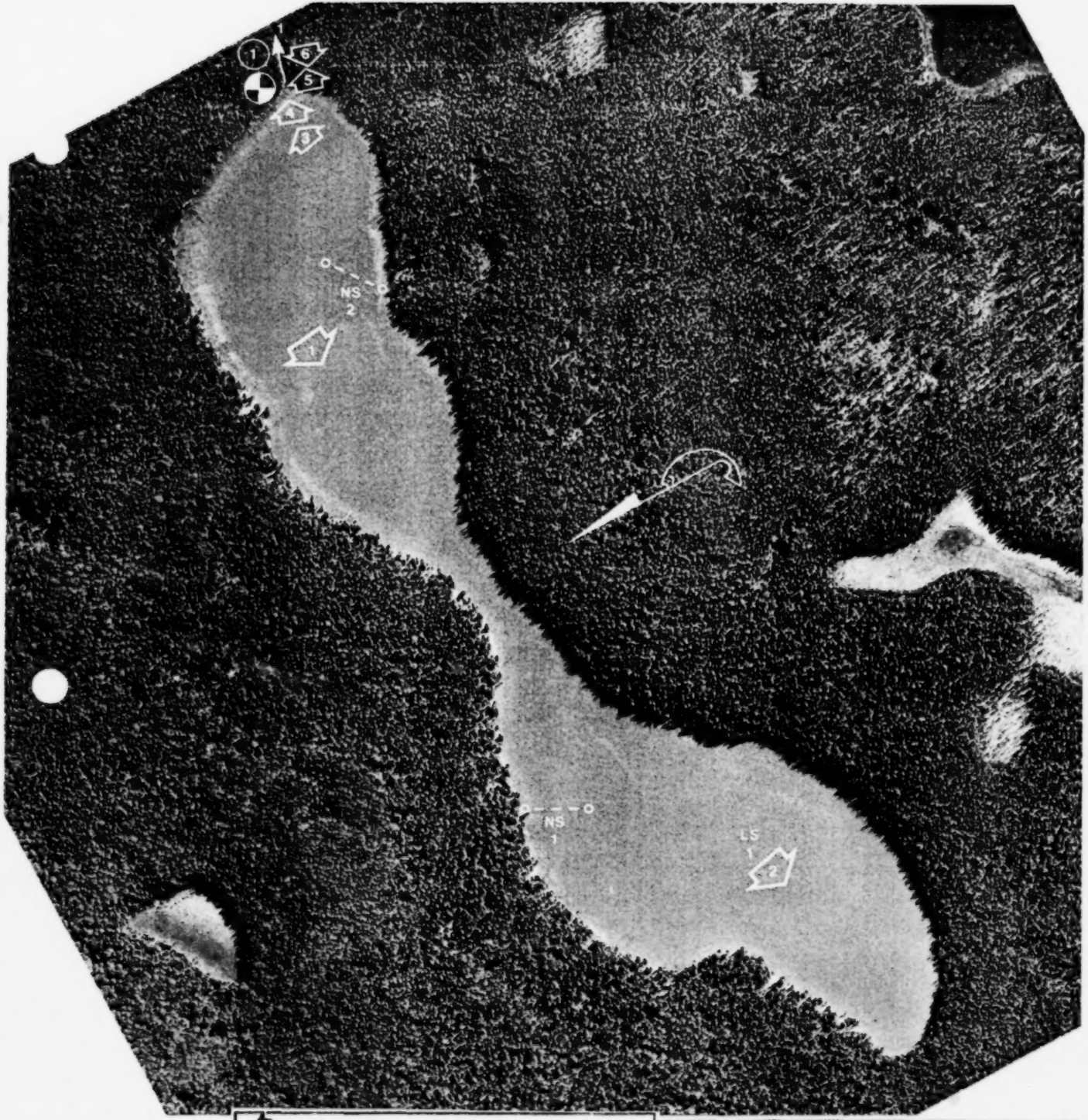
All fish were captured in panel closest to the shore.

Minnow Traps:

BAIT: Sardines

#	HOURS	DEPTH (m)	SUBSTRATE	SPECIES	SIZE RANGE (cm)
1	17.0	1.2	organics	114 northern squawfish	5.6 - 10.7
2	17.0	1.5	organics	100 northern squawfish	5.5 - 8.5

Comments:



1	Plate number, area, and direction
2	Point sample, number, and location
	Bench mark
LS 1	Limno station location and number
0 - - - 0 NS 1	Netting site location and number
1	Stream flow direction and number

LOCATION OF INVENTORY SITES
Figure 1
Lake: Dina (#6)
Reference No.: B.C. 7366:210
Reference Date: July, 1971
Scale: 1:4400

PHOTOGRAPH DIRECTORY

Negative #	Plate #	Description
R1:1A,2A	1	Panoramic view looking west from middle of the eastern basin.
R1:4A,5A	2	Panoramic view looking at the western shoreline from middle of the western basin. Picture taken from the limno station. Forest service access point visible in the middle of the photograph.
R1:6A	3	View of portage trail access point (triangular sign), and bench mark at east end of the lake.
R1:3A	4	View of outlet at east end of lake, and portage access point. Beaver dam is located here, but not easily visible.
R3:12A	5	Downstream view of point sample site #1, on outlet #1, 25 m downstream from the lake and the beaver dam shown in plate 6.
R3:8A	6	View looking upstream at beaver dam on outlet #1, located at eastern end of lake. This dam, which has a length of 9.5 m and height of 1.2 m, appears to be an obstruction to upstream fish passage.

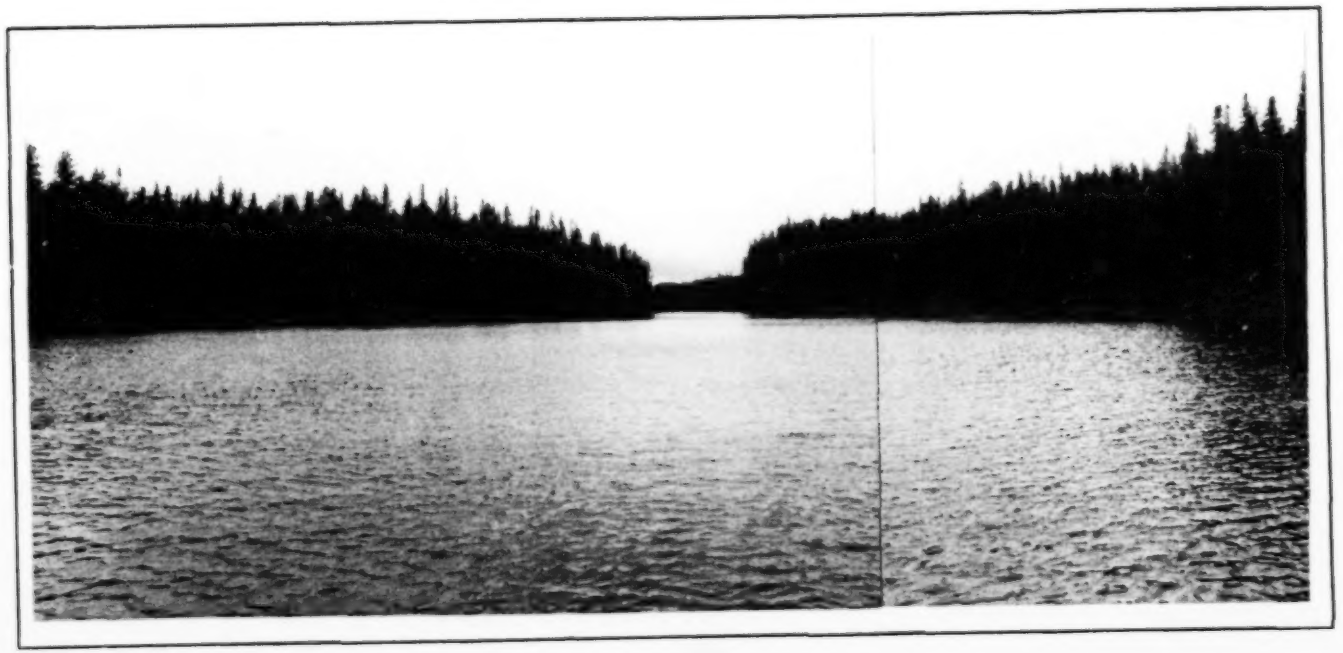


Plate 1: Panoramic view looking west from middle of the eastern basin.

Plate 2: Panoramic view of the western shoreline from middle of the western basin. Picture taken from the limno station.

Plate 3: View of portage trail access point (triangular sign), and bench mark at east end of the lake.

Plate 4: View of outlet at east end of lake, and portage trail access point.

Plate 5: Downstream view at point sample site #1, on outlet #1, 25 m downstream from lake.

Plate 6: View looking upstream at beaver dam on outlet #1, located at east end of the lake. This dam, which has length of 9.5 m and height of 1.2 m, appears to be an obstruction to upstream fish passage.

Appendix A

LABORATORY REPORT

Water Chemistry Analysis

ZENON ENVIRONMENTAL LABORATORIES
Certificate of Analysis

Reported To :

FISH - PRINCE GEORGE Client Code BD

Waste Management Branch
Northern Region
3rd Floor, 1011 4th Avenue
Prince George, BC V2L 3H9

Submitted By : ~~BLACKMAN B~~ ARNE R. LANGSTON
FAX : FISHERIES

Requisition Forms :

	Zenon ID
Form 10016161 received on 15-JUN-1993 completed on 3-JUL-1993 containing sample(s)	93012023 93012024

From sampling site NOSITE DINA LK 6

Remarks :

- All results are blank corrected except for Hi-Res MS data.
- 'MDC' = Minimum Detectable Concentration
- '<' = Less than MDC
- '---' = Not analyzed
- Solids results are based on dry weight except Volatile Organics, TPH and Biota Analyses.
- Organic analyses are not corrected for surrogate recoveries except for Isotope Dilution methods.

Methods used by Zenon are based upon those found in 'Standard Methods for the Examination of Water and Wastewater', 17th Edition, published by the American Public Health Association, 1015 Fifteenth Street, NW, Washington, DC 20005, or on US EPA protocols found in the 'Test Methods For Evaluating Solid Waste, Physical/Chemical Method, SW846', 3rd Edition. Other procedures are based on methodologies accepted by the B.C. Ministry of Environment.

ANALYTICAL REPORT
Form 10016161

Sampling site : NOSITE DINA LK 6
Submitted by : BLACKMAN B

Zenon ID : 93012023

Sparcode	Parameter		Unit	MDC	Media	Workroute
00041220	pH	6.5 (1)	pH units	1.0	02/01	Automated pH Meter
00111160	Specific Conductance	12	uS/cm	1	02/01	Cond.Meter Siebold
00081071	Residue Nonfilt.	< 4	mg/L	4	02/01	Grav; Subsamp Buch 105C
007H1033	Res. Filterable 1.0u	23	mg/L	4	02/01	Grav 1.0 um Filter
01021210	Alkalinity Total 4.5	4.3 (1)	mg/L	0.5	02/01	Automated Electrometer

Sample State : Fresh Water
Sampled on : 93/06/11 00:01 → SURFACE (0.m)

Result comments and/or text results :

(1) Analyzed outside of optimal time frame.

ANALYTICAL REPORT
Form 10016161

Sampling site : NOSITE DINA LK 6
Submitted by : BLACKMAN B

Zenon ID : 93012024

Sparcode	Parameter		Unit	MDC	Media	Workroute
00041220	pH	6.3 (1)	pH units	1.0	02/01	Automated pH Meter
00111160	Specific Conductance	44	uS/cm	1	02/01	Cond. Meter Siebold
00081071	Residue Nonfilt.	28	mg/L	4	02/01	Grav; Subsamp Buch 105C
007H1033	Res. Filterable 1.0u	30	mg/L	4	02/01	Grav 1.0 um Filter
01021210	Alkalinity Total 4.5	18.2 (1)	mg/L	0.5	02/01	Automated Electrometer

Sample State : Fresh Water
Sampled on : 93/06/11 00:02 → Bottom 15.5 m.
Upper Depth : 15.5
Lower Depth : 15.5

Result comments and/or text results :

(1) Analyzed outside of optimal time frame.

DETAILED BILLING
Form 10016161

Sparcode or PKG	Parameter	Secop	Operation	WKU	Price (Regular)	# of tests	Total-per-item WKU	Cost
00041220	pH	4401	pH Meter	3	$3.86	YY.... 2	6	$7.71
00111160	Specific Conductance	4404	Cond.Meter Siebold	5	$6.43	YY.... 2	10	$12.85
00081071	Residue Nonfilt.	4424	Grav. Buch. 9cm 105C	14	$17.99	YY.... 2	28	$35.98
007H1033	Res. Filterable 1.0u	4429	Filt 1.0u Grav 105C	14	$17.99	YY.... 2	28	$35.98
01021210	Alkalinity Total 4.5	4402	Auto.Pot.Tit.St.Acid	11	$14.13	YY.... 2	22	$28.27
					Total for form 10016161 is		94	$120.79

Client code BD : FISH - PRINCE GEORGE
Client type : Ministry contract.
Sampling Site : NOSITE DINA LK 6
Submitted by : BLACKMAN B

This form, entered on 15-JUN-1993 11:14 has been completed on 3-JUL-1993 00:34
The following records have been entered in the charging file :

93-07-03 3R1 BD $120.79 Form 10016161 94 44 - For General Services

Appendix B

TRIBUTARY STREAM DATA

Lake: **Dina #6**

System Name: **Unnamed C.** **outlet #1**

System No.:

Site Location: Sample Site #1, located 25 m downstream of lake on outlet #1.

Date:	June 6, 1991	Time:	1410 hrs
Channel Width:	0.9 m	Water Temp.:	13.0 °C
Wetted Width:	0.25 m	Stage (flow)	N/A
Max. Depth:	4.0 cm	Velocity:	0 m/sec
Avg. Depth:	2.0 cm	Field Gradient:	0.1 %
Turbidity:	4.0 cm	Colour:	gin clear

Flood Signs:

Height: 20 cm

Type: clay bank

Substrate Breakdown:

Fines	Small Gravel	Large Gravel	Cobble
100 %	-- %	-- %	-- %

Boulder	Bedrock
-- %	-- %

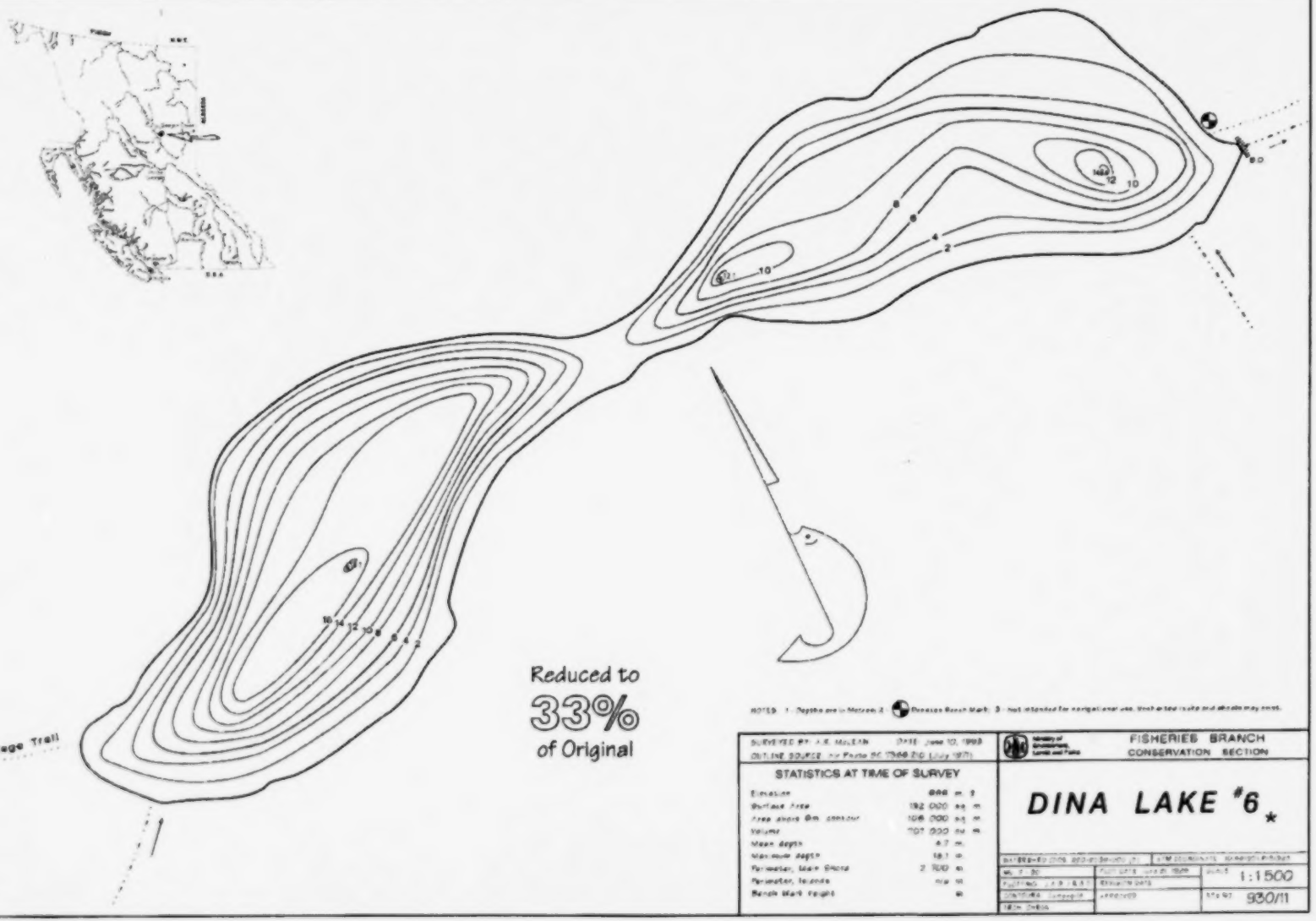
Substrate Compaction: low Sand: 0 %

Banks:

	Form	Height	Stability
Right	repose	0.45 m	stable due to rooted vegetation
Left	repose	0.50 m	stable due to rooted vegetation

Comments:

Flow stage dependent on beaver dam condition.
No spawning or rearing habitat noted.
This site surveyed in 1991 as part of the Dina Lake #5 survey.


Portage Trail
Reduced to
33%
of Original
STATISTICS AT TIME OF SURVEY
FISHERIES BRANCH
CONSERVATION SECTION
DINA LAKE #6 ★
1:1500
930/11